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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/716,556	11/20/2003	Tadashi Iguchi	245469US2DIV	5687
22850	7590	01/11/2005	EXAMINER	
OBLON, SPIVAK, MCCLELLAND, MAIER & NEUSTADT, P.C. 1940 DUKE STREET ALEXANDRIA, VA 22314			CHEN, JACK S J	
			ART UNIT	PAPER NUMBER
			2813	

DATE MAILED: 01/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

<p align="center"><b>Office Action Summary</b></p>	<p>Application No.</p> <p align="center">10/716,556</p>	<p>Applicant(s)</p> <p align="center">IGUCHI ET AL.</p>	
	<p>Examiner</p> <p align="center">-Jack-Chen-</p>	<p>Art Unit</p> <p align="center">-2813-</p>	

**-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --**

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 22 October 2004.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 5-13 is/are pending in the application.
- 4a) Of the above claim(s) 12 and 13 is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 5,7,8 and 11 is/are rejected.
- 7) ☒ Claim(s) 6,9 and 10 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☒ Certified copies of the priority documents have been received in Application No. 09/732,723.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)                        | 4) <input type="checkbox"/> Interview Summary (PTO-413)                     |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)               | Paper No(s)/Mail Date. _____  |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date <u>11/20/03, 2/4/04</u>  | 6) <input type="checkbox"/> Other: _____                                    |

### **DETAILED ACTION**

In response to the communication filed on October 22, 2004, claims 5-13 are active in this application.

#### ***Priority***

Acknowledgment is made of applicant's claim for foreign priority under 35 U.S.C. 119(a)-(d). The certified copy has been filed in parent Application No. 09/732,723, filed on December 11, 2000.

#### ***Information Disclosure Statement***

The information disclosure statement filed on November 20, 2003 and February 4, 2004 has been considered in part.

#### ***Oath/Declaration***

Oath/Declaration filed on November 20, 2003 has been considered.

Applicant's election with traverse of Species I (figs. 1-8B) in the reply filed on October 22, 2004 is acknowledged. The traversal is on the ground(s) that it has not been established an undue burden to examine each of the noted inventions and claims together. This is not found persuasive because this proposed process shows at least four different Species (as noted in the previous office action dated on September 29, 2004) that would require a diversity field of search and it would require undue burdensome search to examine all species.

The requirement is still deemed proper and is therefore made FINAL.

Claims 12-13 are withdrawn from further consideration pursuant to 37 CFR 1.142(b), as being drawn to a nonelected Species, there being no allowable generic or linking claim. Applicant timely traversed the restriction (election) requirement in the reply filed on October 22, 2004.

### *Specification*

1. The title of the invention is not descriptive. A new title is required that is clearly indicative of the invention to which the claims are directed.
2. The disclosure is objected to because of the following informalities: page 7, line 17, the term "1A" should change to -2A--.

Appropriate correction is required.

The specification has not been checked to the extent necessary to determine the presence of all possible minor errors. Applicant's cooperation is requested in correcting any errors of which applicant may become aware in the specification.

### *Claim Objections*

3. Claims 5-11 are objected to because of the following informalities:

Re claim 5, lines 13-14, the phrase "said first gate electrode film" should change to -said first gate electrode material film--.

Re claim 6, line 5, the term "film" should change to -films--.

Appropriate correction is required.

*Claim Rejections - 35 USC § 102*

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

5. Claims 5 and 7 are rejected under 35 U.S.C. 102(e) as being anticipated by Helm et al., U.S./6,635,530 B2.

Helm et al. disclose a manufacturing method of a nonvolatile semiconductor memory device, which comprises making element isolation/insulation films 44 that partition element-forming regions in a semiconductor substrate 42 (figs. 4-5); stacking a first gate electrode material film 5 and a second gate insulating film 54 on said semiconductor substrate via a first gate insulating film 50 (figs. 4-5); etching said second gate insulating film and the underlying first gate electrode material film to make slits (i.e., above layer 44) that separate said first gate electrode material film above said element isolation/insulation films (fig. 7); forming an insulating film 64 on side surfaces of said first gate electrode material film (fig. 7), and thereafter stacking a second gate electrode material film 74 (fig. 9); sequentially etching said second gate electrode material film, said second gate insulating film and said first gate electrode material film to pattern said first gate electrode film into floating gates 52 (fig. 10) and said second gate electrode material film into control gates 74 (fig. 10, inherently shows using this method to form

a plurality of the floating and control gates for an IC); and making source and drain diffusion layers 72 (fig. 10) in self alignment with said control gates, see figs. 1-11 and cols. 1-10 for more details.

Re claim 7, wherein the element isolation/insulation films 44 are buried in grooves (i.e., on both sides of layer 50) formed into the semiconductor substrate 42 (fig. 4). Note: applicant fails to claim that the element isolation/insulation film is STI.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 8 and 11 are rejected under 35 U.S.C. 103(a) as being unpatentable over Helm et al., U.S./6,635,530 B2.

Helm et al. Disclosed above; however, Helm et al. is silent to using ONO for the second gate insulating film.

It is well known in the semiconductor art to use ONO as the gate insulating film. For example, the background section of the prior art (Helm et al.) shows using ONO as the gate insulating film 22 (fig. 2), see col. 2, lines 60-67.

Therefore, the subject matter as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made to select any suitable dielectric layer (i.e., ONO) in the method of Helm et al. in order to provide the desired capacitance between the floating gate and control gate.

Furthermore, the selection of a known material based on its suitability for its intended use supported a prima facie obviousness determination in *Sinclair & Carroll Co., Inc. v. Interchemical Corp.*, 325 U.S. 327, 65 USPQ 297 (1945). "Reading a list and selecting a known compound to meet known requirements is no more ingenious than selecting the last piece to put in the last opening in a jig - saw puzzle." 65 USPQ at 301.).

#### ***Allowable Subject Matter***

9. Claims 6, 9-10 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

The following is a statement of reasons for the indication of allowable subject matter: the prior art of record neither teach nor make obvious the claimed limitation of the instant application as a whole as recited in claim 6. In particular, the prior art does not teach or suggest

the particular subset of the process steps for forming the nonvolatile semiconductor memory device by further forming a first conductive film stacked before formation of said element isolation/insulation films and a second conductive film stacked after formation of said element isolation/insulation film.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jack Chen whose telephone number is (571)272-1689. The examiner can normally be reached on Monday-Friday (9:00am-6:30pm) alternate Monday off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Carl W. Whitehead can be reached on (571)272-1702. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).



Jack Chen  
Primary Examiner  
Art Unit 2813

January 8, 2005